CLAIMS

What is claimed is:

1. A pulser circuit for generating an electrical pulse of short duration for use in an atom probe, comprising:

(a) a circuit comprising at least a first node ;

(b) a voltage supply for charging the first node;

(b) a switching network having a first switch operable between a conductive state for shorting the first node to a grounded node and a nonconductive state for opening the circuit between the first node and the grounded node, and an RC network having a time constant of less than 33 microseconds, comprising at least one resistor connected between the first node and the voltage supply, and wherein the capacitance is a combination of the switch capacitance and at least one capacitor connected to the node, and

(d) wherein the switch is in a nonconductive state to charge the RC network and the switch is in a conductive state to discharge the RC network, thereby generating the electrical pulse.

2. The pulser circuit of claim 1 further comprising a controllable shaping network for providing pulses of selectable amplitudes and shapes.

3. The pulser circuit of claim 1 further comprising at least one switching network connected in series with the RC network

4. The pulser circuit of claim 1 further comprising a shunting network for shunting transients to a low impedance node.

5. A pulser circuit for generating an electrical pulse of short duration for use in an atom probe, comprising:

(a) a circuit comprising at least a first node ;

(b) a voltage supply for charging the first node;

(c) a switch operable between a conductive state for shorting the first node to a grounded node and a nonconductive state for opening the circuit between the first node and the grounded node;

(d) a controllable RC network, comprising at least one resistor connected between the first node and the voltage supply, and wherein the capacitance is a combination of the switch capacitance and at least one capacitor connected to the node, for generating pulses having selectable amplitudes and shapes; and

(e) wherein the switch is in a nonconductive state to charge the RC network and the switch is in a conductive state to discharge the RC network, thereby generating the electrical pulse.

6. A pulser circuit for generating an electrical pulse of short duration for use in an atom probe, comprising:

(a) a circuit comprising at least a first node ;

(b) a voltage supply for charging the first node;

(c) a first switch operable between a conductive state for shorting the first node to a grounded node and a nonconductive state for opening the circuit between the first node and the grounded node;

(d) an RC network, comprising at least one resistor connected between the first node and the voltage supply, and wherein the capacitance is a combination of the switch capacitance and at least one capacitor connected to the node,

(e) at least one or more second switching networks connected in series;

(f) wherein the switch is in a nonconductive state to charge the RC network and the switch is in a conductive state to discharge the RC network, thereby generating the electrical pulse.